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(51) INT CL:
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(52) UK CL (Edition X):
G4A AFGDC

(56) Documents Cited:
GB 2399661 A **DE 202004007194 U1**
US 6890188 B1 **US 6676420 B1**
US 6567273 B1 **US 5565704 A**

(58) Field of Search:
UK CL (Edition X) **G4A**
INT CL **G06F, G06K, H01R**
Other: **Online: WPI; EPODOC; Internet**

(54) Abstract Title: **Memory card with an integral dual interface**

(57) A dual interface memory card comprises a memory unit, a main interface 13, a connection interface 14, located on the casing 11, and a control chip having a dual interface transmission function located inside the casing, with the control chip being connected to the memory unit, the main interface unit and the connection interface. The control chip could include at least one memory card controller, a flash controller and low voltage differential signal components. The memory card casing could have the physical form and main interface of well known memory cards such as compact flash (CF) or multimedia card (MMC). The connection interface could be either USB or an IEEE standard interface. When in use, the memory card can be put into a device. The memory card can be removed from the device and the connection interface could then either be slid out or pivoted out from the main memory card casing to allow the USB or IEEE connection to be used thus enabling a simple connection to a personal computer without the need for a card reader.

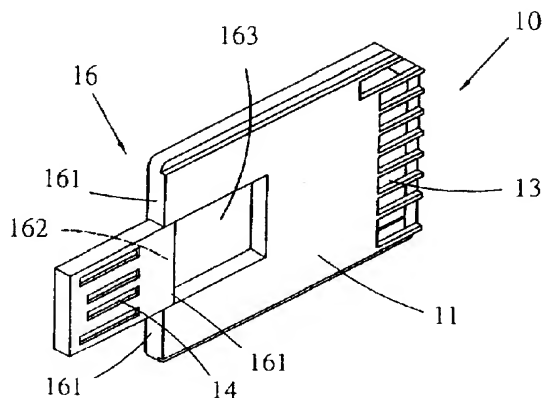


FIG. 5

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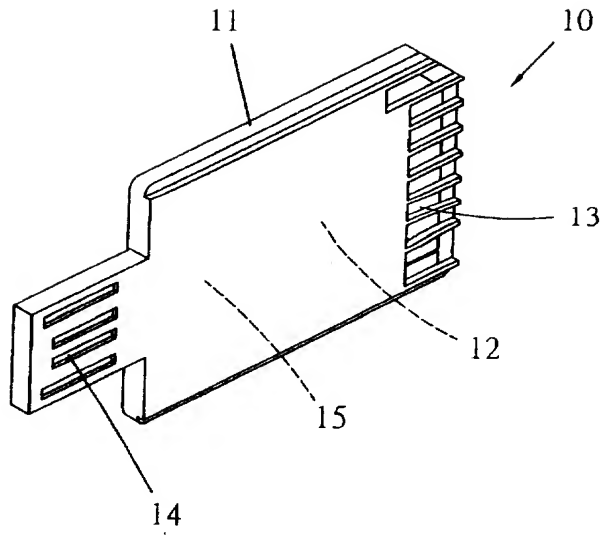


FIG. 1

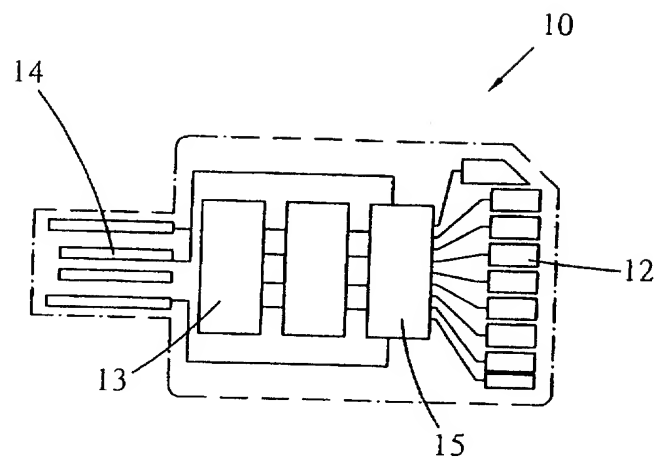


FIG. 2

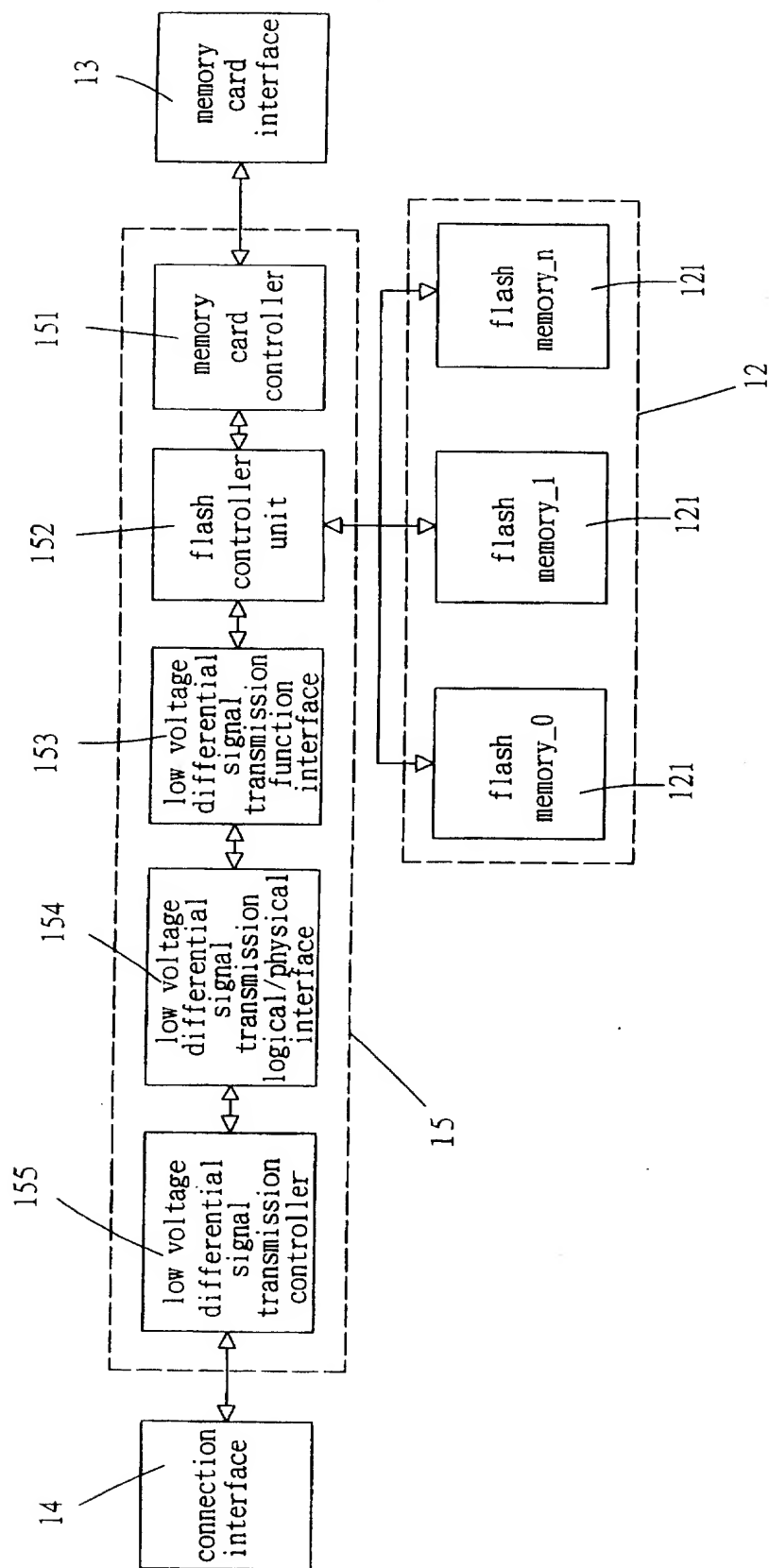


FIG. 3

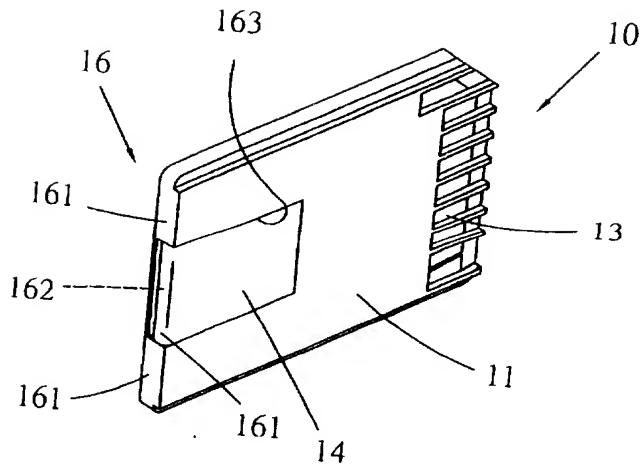


FIG. 4

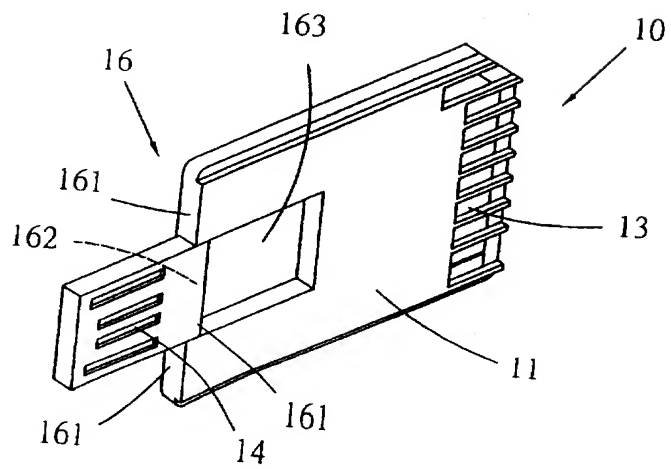


FIG. 5

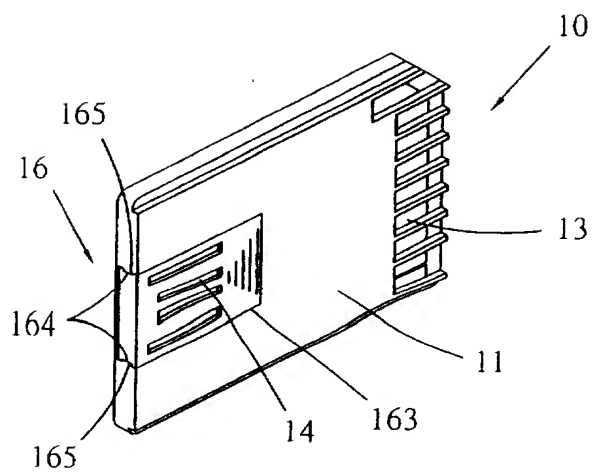


FIG. 6

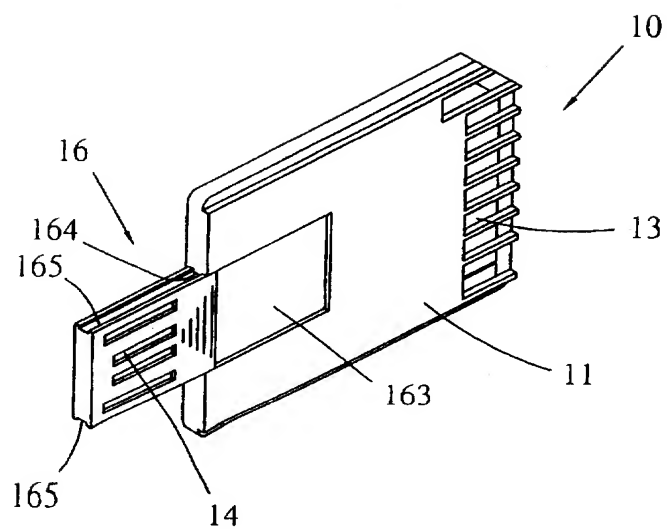


FIG. 7

DUAL INTERFACE STORAGE CARRIER

BACKGROUND OF THE INVENTION

(a) Field of the Invention

5 The present invention relates to a dual interface storage carrier, and more particularly to a dual interface storage carrier which does not require a card reader but can use its own connection interface to link to an electronic device such as a computer.

(b) Description of the Prior Art

10 As a storage carrier in a memory card style is provided with a large capacity, a small size, and a high stability, it is widely used in a portable electronic device such as a digital camera, an MP3 player, a notebook computer, a personal digital assistant (PDA), and a cellular phone. In addition, related industries are continuously developing memory cards
15 with a larger capacity, a faster transmission speed, and a smaller size, in order to meet application requirements of a newer generation of products. The storage carriers in the memory card style available in the existing market include primarily an SD (Smart Digital) memory card, an MS (Memory Stick) memory card, a CF (Compact Flash) memory card,
20 an SM (Smart Media) memory card, an MMC (Multi Media Card)

memory card, and even an MD (IBM Micro Drive) micro drive. Their data storage methods include a silicon disk or a hard disk, and some of them have a remarkable difference in shape and size.

Accordingly, in order to link the similar storage carrier to other
5 electronic device to facilitate internal data access, a conversion interface so called the card reader should be used additionally, so as to construct a link of data transmission between the storage carrier in memory card style and the electronic device like computer. However, as there are so many kinds of storage carriers in memory card style available in the
10 market, a consumer will have to possess many kinds of card readers or a multi-function card reader, which is not economic and will also cause a trouble in carrying the card readers.

SUMMARY OF THE INVENTION

Accordingly, the present invention consists of a connection interface
15 located at an opposite end to a main interface on a casing of a storage carrier, and a control chip having a dual interface transmission function located inside the casing. The control chip is also connected to a memory unit, the main interface, and the connection interface. Thus, a dual interface storage carrier which can use its own connection interface
20 to link to an electronic device such as a computer, without using a card

reader, is constructed.

To enable a further understanding of the said objectives and the technological methods of the invention herein, the brief description of the drawings below is followed by the detailed description of the preferred
5 embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a perspective view of a first implementation of a storage carrier of the present invention.

FIG. 2 shows a schematic view of a basic structure of a storage carrier of
10 the present invention.

FIG. 3 shows a schematic view of a structure of a control chip of the present invention.

FIG. 4 shows a perspective view of a second implementation of a storage carrier of the present invention.

15 FIG. 5 shows a schematic view of an application status of a second implementation of a storage carrier of the present invention.

FIG. 6 shows a perspective view of a third implementation of a storage carrier of the present invention.

FIG. 7 shows a schematic view of an application status of a third
20 implementation of a storage carrier of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1 and FIG. 2, the present invention uses a casing 10 as a primary mechanical structure for constructing a memory unit 12 by an entire storage carrier 10. A shape of the casing 11 can fit with a shape of an SD (Smart Digital) memory card (as shown in the drawings), an MS (Memory Stick) memory card, a CF (Compact Flash) memory card, an SM (Smart Media) memory card, an MMC (Multi Media Card) memory card, and even an MD (IBM Micro Drive) micro drive. A main interface 13 is located at a specific location on the casing 11 for linking to an portable electronic device such as a digital camera, an MP3 player, a notebook computer, a personal digital assistant (PDA), and a cellular phone of its respective specification.

The primary characteristics of the present invention lies in that a connection interface 14 is located at an opposite end to the main interface 11, and a control chip 15 having a dual interface transmission function is located inside the casing 11. This control chip 15 is also connected to the memory unit 12, the main interface 13, and the connection interface 14. Upon implementation, the entire storage carrier 10 can be a form of a silicon disk memory card. Referring to FIG. 3 at the same time, the memory unit 12 can be constructed by at least one flash

memory 121, and the connection interface 14 can be a USB (universal serial bus) as shown in the drawing, or a standard interface specified by the IEEE (Institute of Electrical and Electronic Engineers).

The control chip 15 includes further at least one memory card controller 151, one flash controller unit 152, one low voltage differential signal transmission function interface 153, one low voltage differential signal transmission logical/physical interface 154, and one low voltage differential signal controller 155. Accordingly, the entire storage carrier 10 can be linked to a portable electronic device such as a digital camera, an MP3 player, a notebook computer, a personal digital assistant (PDA), and a cellular phone through the main interface 13, it can be even directly linked to an electronic device like a computer through the connection interface 14, with the internal control chip 15 in charge of data conversion, in order to increase a convenience and applicability of a mutual linking between the storage carrier 10 and many kinds of electronic devices.

Referring to FIG. 4 to FIG. 7, it is worth to be mentioned that a movable mechanism 16 is located between the connection interface 14 and the casing 11 for enabling a corresponding change in position between the connection interface 14 and the casing 11, such that the

connection interface 14 can be exposed out of an end of the casing 11 by a specified length, or be hidden in the interior of end surface of the casing 11, thereby enabling the shape of entire storage carrier to completely fit with the memory card of its respective specification.

5 In the implementation depicted in FIG. 4 and FIG. 5, the movable mechanism 16 consists of mutually connected pins 161 which are located on the casing 11 and the connection interface 14 respectively with a pivot 162 passing between them. In addition, a concave part 163 is located on the casing 14 for holding the connection interface 14, such
10 that the connection interface 14 can be hidden by folding it toward the concave part 163. On the other hand, in the implementation depicted in FIG. 6 and FIG. 7, the movable mechanism 16 consists of mutually connected slots 164 and rails 165 which are located at a joint place between the casing 11 and the connection interface 14, respectively.
15 Similarly, a concave part 163 is located on the casing 11 for holding the connection interface 14, such that the connection interface 14 can be hidden by directly pushing it into the concave part 163.

It is of course to be understood that the embodiments described herein is merely illustrative of the principles of the invention and that a
20 wide variety of modifications thereto may be effected by persons skilled

in the art without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. A dual interface storage carrier comprising a memory unit and a main interface constructed on a casing, wherein a connection interface and a control chip having a dual interface transmission function are located additionally on the casing, with the control chip being connected to the memory unit, the main interface, and the connection interface.
2. The dual interface storage carrier according to claim 1, wherein the memory unit is composed of at least one flash memory.
3. The dual interface storage carrier according to claim 1, wherein the control chip includes at least one memory card controller, one flash controller unit, one low voltage differential signal transmission function interface, one low voltage differential signal transmission logical/physical interface, and one low voltage differential signal controller.
4. The dual interface storage carrier according to claim 1, wherein the connection interface is located on the casing at an opposite end to the main interface.
5. The dual interface storage carrier according to claim 1 or 4, wherein a movable mechanism is located between the

connection interface and the casing for enabling a corresponding change in position between the connection interface and the casing.

5 6. The dual interface storage carrier according to claim 5, wherein the movable mechanism consists of mutually connected pins which are located on the casing and the connection interface respectively, with a pivot passing between them, and a concave part is located on the casing for holding the connection interface.

10 7. The dual interface storage carrier according to claim 5, wherein the movable mechanism consists of mutually connected slots and rails which are located at a joint place between the casing and the connection interface respectively, and a concave part is located on the casing for holding the connection interface.

15 8. The dual interface storage carrier according to claim 1, wherein the casing can be in a shape of an SD memory card, an MS memory card, a CF memory card, an SM memory card, an MMC memory card, or an MD micro drive.

20 9. The dual interface storage carrier according to claim 1, wherein the main interface can be a transmission interface of an SD memory card, an MS memory card, a CF memory card, an SM

memory card, an MMC memory card, or an MD micro drive.

10. The dual interface storage carrier according to claim 1, wherein
the connection interface can be a USB or an IEEE standard
interface.

5 11. Dual interface storage carrier substantially as herein described
above and illustrated in the accompanying drawings.

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Application No: GB0519319.8

Examiner: Mr Rich Corken

Claims searched: 1-11

Date of search: 4 January 2006

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-10	US 6676420 B1 (LIU et al) - see abstract and figure 1
X	1-10	US 6567273 B1 (LIU et al) - see abstract and figure 5
X	1-10	US 6890188 B1 (LE) - see col. 2 line 3-col. 3 line 25 and figures 4A & 7
X	1-10	US 5565704 A (TOKUNO) - see column 2 lines 43-58 and figure 3
X	1	DE 202004007194 U1 (HAICOM) - see English abstract
A	-	GB 2399661 A (CARRY COMPUTER) - see abstract and figure 8

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

G4A

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

G06F; G06K; H01R

The following online and other databases have been used in the preparation of this search report

WPI; EPODOC; Internet